9. Human and Natural Environment Strategic Goal

"Protect and enhance communities and the natural environment affected by transportation"

9.1 Outcomes

1. Improve the sustainability and livability of all communities

2. Reduce the adverse effects of transportation on ecosystems and the natural environment

3. Improve the viability of ecosystems

4. Reduce the adverse effects of transportation facilities on the human environment

5. Improve equity for low income and minority communities concerning the benefits and burdens of transportation facilities and services

6. Reduce the amount of pollution from transportation sources

9.2 Strategies

Transportation is the tie that binds us together as a nation. But transportation also can have the unwanted side effects of air and noise pollution as well as the loss of valuable ecosystems. We are committed to avoiding or mitigating the adverse environmental effects that can accompany transportation to the greatest degree possible.

Our Human and Natural Environment strategies are directed toward making DOT more effective in fulfilling its responsibilities as one of the federal stewards of the environment. The strategies emphasize DOT's collaboration with the public, all levels of government,[1] and private sector stakeholders to identify and integrate the full range of environmental and community concerns into policies, operations, investments, regulations and research. These concerns include impacts of transportation with respect to the global commons, environmental justice and integrating bicycling and walking into the transportation system.

We will execute six multi-modal strategies to achieve the environmental outcomes presented above. We will: 1) advocate early, continuous, and collaborative transportation planning; 2) work proactively with government and industry in the United States and internationally to set environmental standards and enforce environmental policies and laws; 3) foster dialogue, education and communication about transportation alternatives; 4) sponsor interdisciplinary research on connections between transportation and the environment; 5) improve information on

[1] i.e., other federal agencies, tribes, state and local governments, and Metropolitan Planning Organizations.

transportation and the environment and 6) create incentives to avoid or mitigate the adverse environmental effects that can accompany transportation.

In contrast to the DOT safety strategies all of which supported our safety outcomes of reduced fatalities and injuries, our environment strategies are targeted to specific outcomes. The resources and programs listed in DOT's Performance Plan and budget are necessary to achieve the environment outcomes presented above and the strategies presented below. Each year, DOT reassesses its performance goals and targets based upon appropriations. The schedule for executing the strategies extends from the present through 2005. We will continue to benchmark and improve processes and move quickly toward electronic government to improve our efficiency and customer service.

9.2.1 Infrastructure and Investment Strategies:

a. Form alliances for public and private investment in transportation facilities and services to make communities more livable by helping them link growth strategies, land use plans, safety, environmental quality and economic development; (Supports outcomes 1, 4 and 5)
b. Help all levels of government and communities find ways to use transportation more effectively through planning techniques and operations that are sustainable, community friendly, improve environmental protection, environmental justice and scenic qualities; (Supports outcomes 1, 2 and 4)
c. Advance environmentally preferable transportation solutions, such as pedestrian travel, bicycling, mass transit and virtual travel, as alternatives to personal vehicle use; (Supports outcomes 1, 2, 4 and 5)
d. Support, leverage and broker public and private investments in transportation by integrating economic development, environmental viability and social equity; (Supports outcomes 1-5)
e. Promote public involvement in planning and ensure compliance with Title VI of the Civil Rights Act to reduce adverse impacts of transportation infrastructure and operations on minority and low-income communities and ensure the equitable distribution of transportation facilities and services. (Supports outcomes 1 and 4)
f. Work with other agencies to improve and streamline the environmental review process while improving environmental protection; and (Supports outcomes 2 and 3)
g. Improve DOT-owned or controlled facilities for the benefit of host communities by preventing pollution, recycling, using recycled products, and cleaning up contaminated facilities. (Supports outcomes 2, 4 and 5)

9.2.2 Strategies for Standards and Enforcement:

a. Protect indigenous species, ecosystems and communities by developing civil rights and environmental regulations and standards in partnership with stakeholders such as other federal agencies, tribal nations, states, metropolitan planning organizations, local governments and interest groups. (Supports outcomes 1-5)
b. Work with other federal agencies, state and local governments and the private sector to ensure readiness, availability, and coordination of resources and capacity to respond to incidents of environmental damage and natural resource degradation. (Supports outcomes 1, 2 and 4)

c. Work with all levels of government and the private sector to participate in environmental policy negotiations and the formation of international agreements and institutions that affect transportation. (Supports outcome 2)
d. Develop and maintain regional and international agreements with other nations, federal, state and local governments and the private sector to improve the coordination and effectiveness of law enforcement efforts that protect ecosystems. (Supports outcome 2)
e. With public and private partners, identify and counter threats to ecosystems and the natural environment through improved pollution prevention and response activities. (Supports outcomes 2 and 3)

9.2.3 Communication, Education and Outreach Strategies:

a. Work with other agencies, the public and institutions to teach the next generation about the environmental impact of individual transportation decisions. (Supports outcome 1)
b. Provide timely information to the public in various useful and understandable formats about transportation's impact on the environment including but not limited to:
   - transportation alternatives such as bicycling and walking to help communities make choices;
   - benefits of reducing transportation-related pollutants (air, land and water) into the environment; and
   - adverse environmental effects of siting, construction, and operation of transportation facilities and systems. (Supports outcome 1)
c. Work with federal, state and local agencies to reduce public health and environmental risks related to transportation projects and systems. (Supports outcomes 1 and 4)
d. Foster dialogue among local, minority and low-income communities, state and tribal governments, private sector stakeholders and the public in developing metropolitan and statewide transportation plans (including intermodal, port and airport plans) to improve consideration of public health, social, environmental, and economic factors in transportation planning as well as equitable distribution of transportation benefits. (Supports outcomes 1 and 4)

9.2.4 Research and Development Strategies:

a. Work with all levels of government, the public and the private sector to develop and execute a strategic, interdisciplinary research agenda on the environmental impacts of all modes of transportation including research on renewable fuel sources, zero-emission propulsion systems and advanced monitoring of transportation-related pollution and energy use. (Supports outcomes 1, 2, 3, 4 and 6)
b. Support the development, demonstration and rapid deployment of transportation technologies for energy efficient and environmentally compatible transportation and propulsion systems. (Supports outcomes 1 and 5)
c. Conduct research on technologies that will reduce the waste, pollution and emissions generated in the production of infrastructure materials. (Supports outcomes 2, 4 and 6)

9.2.5 Analysis and Information Strategies:

a. Increase the timeliness, validity and reliability of transportation data related to the human and natural environment by taking advantage of web-enabled technologies. (Supports outcome 5)

b. Collect, analyze and publish transportation data and information in various useful and understandable formats to identify critical environmental trends and issues and the health and physical impacts of transportation projects on communities. (Supports outcome 1)

9.2.6 Incentives Strategy: Build alliances to create incentives for avoiding or mitigating the adverse environmental effects that can accompany transportation.

a. Develop incentives for innovations in transportation vehicles, infrastructure and equipment that pollute less and cause less damage to the environment. (Supports outcomes 1, 2, 3 and 6)
b. Create incentives for developing and using alternative fuels, alternative transportation modes, and increasing fuel efficiency gains. (Supports outcomes 2 and 6)

9.3 Management Challenges

The strategies presented in the preceding section represent our approach to the environmental challenges to transportation in the future. However, we recognize that achievement of our Human and Natural Environment outcomes is contingent upon addressing the priority management issues identified by the GAO and DOT's OIG which are discussed below. The language that describes each challenge is essentially the language used by the OIG.

9.3.1 MARAD Ship Disposal Program

The OIG has noted that MARAD is required, by legislative mandate, to dispose of obsolete vessels in the National Defense Reserve Fleet (NDRF) by September 30, 2001 in a manner that maximizes financial return to the U.S. Previously, MARAD sold the vessels overseas for scrapping. Since 1994, MARAD has refrained from exporting these vessels because of concerns about the environment, and worker health and safety. As a result, MARAD has incurred additional costs to maintain the ships prior to their sale and disposal in the U.S. where there is only a small domestic ship scrapping industry.

The OIG observed that the federal government faces a challenge in disposing of its fleet of obsolete vessels in a timely manner. Environmental dangers associated with MARAD's deteriorating vessels increase daily. The requirement to maximize financial returns in their disposal may not work in today's marketplace. In 1999, the NDRF contained 112 vessels designated for priority disposal and MARAD expects its inventory to increase by 2001 if no additional vessels are sold.

MARAD has acknowledged this environmental challenge and has set a performance goal to meet it in support of outcomes 2, 4 and 6.

Milestone: MARAD will reduce the inventory of obsolete vessels in the NRDF. Additionally, MARAD is developing an action plan which will propose specific achievement milestones that will be incorporated into the DOT and MARAD FY 2002 Performance Plans.

9.4 Completed Program Evaluations

DOT has evaluated four key programs to determine their effectiveness in avoiding or mitigating the adverse environmental effects that can accompany transportation. The results of the evaluations are presented below.

9.4.1 Livable Communities Evaluation (FTA): The purpose of the Livable Communities Initiative (LCI) is to improve the quality of life in urban and rural communities through the use of transit systems. The objective of the evaluation was to document the impact of the concepts demonstrated by the 16 Livable Communities projects on the attainment of the LCI goals. The sixteen projects involved a variety of concepts designed to link transit and its immediate communities by improving personal mobility, transportation system performance, access to community services and the quality of life. The evaluation found community involvement in the planning process; leveraged resources for transit improvement; planning for travel outside the project area; and institutionalization of the concepts. As a result of this evaluation, there are now several programs and policies that reflect Livable Communities concepts, including several concepts that have been incorporated in TEA-21 and in several of our strategies especially in section 9.2.1 in support of outcomes 1 and 4.

9.4.2 Fisheries Law Enforcement Deterrence Study (USCG): This study used historical search and rescue demand data as well as historically based estimates of other workload to assess whether the USCG has allocated small boats to shore stations in the most effective manner. Findings indicated that the majority of USCG stations may have a shortage of available boat capability to meet current and estimated demand but a few stations may have excess boat capability which can be reallocated to stations with shortages. USCG will reallocate as appropriate. We considered this study as we developed our strategy 9.2.2.b that addresses the readiness, availability and coordination of resources to respond to incidents of environmental degradation in support of outcome 4.

9.4.3 Ocean Guardian Strategic Plan (USCG): This evaluation identified the need to: ensure a strong national constituency base; to develop clear, easily enforceable regulations; and to tailor the application of fishery management and enforcement tools. Ocean Guardian provides guidance to field commanders to ensure our enforcement actions are consistent and supportive of national interests. The study also validated that USCG operations are still consistent with recommendations of the USCG 1993 Fisheries Study. We considered the results of this evaluation as we developed our environmental strategies that address standards and enforcement. Section 9.2.2 calls for protecting indigenous species and ecosystems in partnership with an ever expanding constituency base in support of outcome 2.

9.4.4 National Bicycling and Walking Study Five Year Progress Report: In 1994, DOT adopted the National Bicycling and Walking Study with the twin goals of increasing use and improving safety for these two modes. A five year progress report released in 1999 found that while significant progress had been made, DOT must renew its commitment to elevating bicycling and walking to become part of the

transportation mainstream as evidenced by several strategies in this plan such as 9.2.1.c and 9.2.3.b in support of outcomes 1 and 4.

9.5 External Factors

DOT used four scenarios[2] in the planning process to illustrate how external factors might play a part in our achieving our environmental outcomes. Globalization, demographics, the U.S. economy and the role of government were the major dimensions of the scenarios. We learned that these and many other external factors such as global climate change, traffic congestion, air pollution, new technology and land use may effect our ability to achieve our environmental outcome goals. Unable to predict how these complex external factors may interact to effect transportation, we have presented both positive and negative consequences.

9.5.1 Ecological Factors

Global warming could become more severe. As a result, there could be increased public pressure to reduce emissions from transportation sources. The four warmest years on record since 1860 have all occurred since 1990. In some areas, primarily over continents, the warming has been several times greater than the global average. Other evidence of global temperature increases since the nineteenth century includes the observed rise in sea level of 10 to 25 centimeters (about four to 10 inches), the shrinkage of mountain glaciers, a reduction of northern hemisphere snow cover (1973 to present), and increasing sub-surface ground temperatures. The burning of coal, oil, and natural gas, as well as deforestation and various agricultural and industrial practices, are altering the composition of the atmosphere and contributing to climate change. These human activities have led to increased atmosphere concentrations of a number of greenhouse gases, including carbon dioxide, methane, nitrous oxide, and chlorofluorocarbons in the lower part of the atmosphere. (Impacts outcomes 2 and 6)

Transportation faces a significant challenge to control and minimize air, water, and noise pollution or face a public backlash that may impede system improvement. There may be non-air quality environmental and social impacts resulting from otherwise desirous advances in low- to no-emission transportation technologies (i.e., hybrid and fuel cell drive trains). With the advent of hybrids, air quality improves and people may drive more rather than less. With more driving may come increased pressure on land and water use, more congestion, and other adverse effects. Transportation planning should take this likelihood into account. (Impacts outcomes 1, 4, 5 and 6)

Planning and development of transportation infrastructure that is resistant to environmentally caused damage (e.g. earthquakes, floods, etc.) is an increasing need and new challenge. It will support the reduction of transportation cost and trip time variance and improved transportation timeliness. (Impacts outcomes 1, 2 and 3)

Limited petroleum reserves and environmental concerns may curtail future petroleum exploration and extraction and lead to decreases in available reserves. (Impacts outcomes 1, 5 and 6)

[2] DOT's global transportation scenarios are at www.dot.gov/stratplan

9.5.2 Technology Factors

Advances in fuel cells and blended fuel engines for automobiles will take mileage up to 70-80 miles per gallon. The availability of ultra-clean fuel cells for cars whose only by-product will be water clean enough to drink, should reduce transportation's contribution to global climate change. Research to develop cleaner fuels such as fuels with lower sulfur content is proceeding and regulatory requirements for cleaner fuels are in place or being developed. The challenge is to ensure that improvements in one area do not lead to increased pollution in another area. Tradeoffs must be balanced as we make technical progress. (Impacts outcomes 2, 3 and 6)

Traffic congestion and air quality are becoming major challenges that require solutions not only for our largest metropolitan areas, but for mid-size cities as well. Cities that were once considered the most-desired places to live or for businesses to locate – places like Atlanta, Denver, or Milwaukee – are now seeking ways to unclog their increasingly congested roadways and regain their quality of life. (Impacts outcomes 1, 2, 4, 5 and 6)

E-commerce and national competitiveness will drive the need for greater collaboration between the public and private sectors to ensure the integration and deployment of new technologies into the transportation system (including those related to advanced composites, energy and the environment). Business-to-business e-commerce, estimated to be 10 times the volume of business-to-consumer, amounted to $100 billion in 1999 but is estimated to grow to between $1 trillion to $3 trillion in 2003 – with huge demand implications for transportation. (Impacts outcomes 1-6)

9.5.3 Political Factors

The role of national government is changing with an ongoing shift away from top down centralized decision-making and a shift towards increased state and local control of transportation. These trends could reverse if significant climate changes or if a rise in protectionism between international regional trading blocks were to occur. (Impacts outcomes 1-6)

The changing regulatory climate is shifting toward minimizing national regulations, reducing international barriers to trade, and harmonizing international transportation regulations. This shift supports the reduction of transportation cost and trip time variance and improved transportation timeliness. Globalization may impact DOT's ability to regulate pollutants produced by transportation sources. (Impacts outcomes 1-6)

The forces of agglomeration and urbanization that hold cities together may be affected by the nature of economic activity, resulting in possible changes in the size and geographic distribution of urban areas, development of economically integrated regions and an increase the use of and exposure to risks in the transportation system. (Impacts outcomes 1, 4 and 5)

Transportation infrastructure additions or expansions of the existing transportation network may be limited due to environmental concerns, leading to deteriorating physical conditions and increased travel times and user costs. (Impacts outcomes 1, 4 and 5)

Changing demographics in the immigrant and the elderly populations will introduce new cultural norms that will affect the way communities form, organize and use transportation. (Impacts outcome 1)

9.6 Relationship Between Strategic Plan Outcomes and Performance Plan Candidate Measures

Each environmental outcome in the Strategic Plan for 2000-2005 will be supported by one or more environmental performance measures fully developed in DOT's Annual Performance Plans for the fiscal years 2001-2005. Table 9.6 illustrates the relationships between the outcomes in the Strategic Plan and the measures in the Performance Plan. The measures presented in Table 9.6 are candidates for the Performance Plan and not final selections.

Table 9.6 Human and Natural Environment Strategic Goal, Outcomes and Performance Plan Candidate Measures

"Protect and enhance communities and the natural environment affected by transportation"

Outcomes	Performance Plan Candidate Measures
Improve the sustainability and livability of all communities Reduce the adverse effects of transportation on ecosystems and the natural environment Improve the viability of ecosystems Reduce the adverse effects of transportation on the human environment Improve equity for low income and minority communities concerning the benefits and burdens of transportation facilities and services Reduce the amount of pollution from transportation sources	<u>Sustainability/Livability</u> Percent of urban population living within a quarter mile of transit stop with average headway of 15 minutes or less (non-rush hour) Billion transit passenger miles traveled <u>Adverse Effects</u> Percentage of DOT facilities categorized as No Further Remedial Action Planned under the Superfund Amendments and Reauthorization Act Acres of wetlands replaced for every acre affected by federal-aid highway projects (where impacts are unavoidable) <u>Ecosystems</u> Percent change in number of species that are designated as over-fished <u>Environmental Justice/Equity</u> Number of environmental justice complaint cases that remain unresolved after one year <u>Pollution</u> Tons (in millions) of mobile source emissions from on-road motor vehicles Metric tons (in millions) of carbon equivalent emissions from transportation sources Number of people in the U.S. (in thousands) who are exposed to significant noise levels (65 decibels or more) Gallons spilled per million gallons shipped, by maritime sources Tons of hazardous liquid materials spilled per million ton-miles shipped by pipeline

9.7 Data Capacity

The candidate performance measures in Table 7.6 above include measures utilized in DOT's 2001 Performance Plan and new candidate measures. DOT has developed data for each measure

and has published source and accuracy statements for each of the data systems used for constructing these measures.[3] We have described the scope of each measure, the limitations of the data and the statistical issues regarding uncertainty in the measurement.[4] Led by the Bureau of Transportation Statistics (BTS), DOT's operating administrations are implementing a plan for verification and validation of all departmental data used in implementing GPRA and for other analytical purposes.[5] DOT is committed to continuous improvement in the accuracy, reliability and timeliness of environmental data relating to transportation and will execute the improvements presented below.

Data Needs for Human and Natural Environment
DOT's environment outcomes present difficult measurement issues and new frontiers in terms of data we have collected historically. Our challenge is to measure the results we want to achieve against our goals. Accordingly, resources permitting, we will: 1) develop comparable and complete data on transportation emissions, noise, hazardous materials releases, and wetlands impacts; 2) improve our understanding of collateral damage to the human natural environment; 3) create better leading indicators for potential environmental issues; and 4) develop a reliable method of measuring the use of bicycling and walking.

9.8 Cross-Cutting Programs

DOT collaborates with other federal agencies on a variety of programs concerning the environment. Regularly, DOT staff communicates and meets with other agencies to align policies, goals, regulations, process, field work and events that advance these initiatives. For this section of the plan, we have selected partnerships that are most directly aligned with our environment strategic goal and outcomes.

9.8.1 Environmental Justice

Goal: Identify and address disproportionately high and adverse human health and environmental effects of transportation policies and programs on minority populations and low-income populations. (Supports outcome 5)
Agencies Involved: DOT/Office of Civil Rights lead, Environmental Protection Agency, Departments of Health and Human Services and Justice, National Institutes of Health, Bureau of the Census, state government, civil rights groups, and minority and low income populations.

9.8.2 National Millennium Trails

Goal: A national initiative to create, enhance, and celebrate more than 2,000 trails as part of America's legacy for the future. Partners from cultural, heritage and trail organizations in the public and private sectors are working together to create a national network of trails. (Supports outcome 1)
Agencies Involved: DOT Office of Policy Lead, White House Millennium Council, Department of the Interior, public and private trail organizations.

9.8.3 Center for Climate Change and Environmental Forecasting

Goals: To address environmental and climate change concerns through an intermodal systems approach; to enable the transportation sector to contribute to national goals for greenhouse gas reductions; and to ensure that the nation's transportation systems are prepared to address the potential long-range effects of global climate change. (Supports outcomes 2, 4 and 6)

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[3] See www.bts.gov
[4] See Appendix I DOT 2001 Performance Plan
[5] See page 161 DOT 2001 Performance Plan

Agencies Involved: DOT/Office of Policy Lead, White House Task Force on Climate Change, the Departments of State, Energy and Agriculture, and National Aeronautics and Space Administration, National Oceanic and Atmospheric Administration, and the Environmental Protection Agency.

9.8.4 Environmental Streamlining

Goal: To shorten the time for transportation project delivery by making the environmental analysis and approval process more efficient. (Supports outcomes 1 and 4)

Agencies Involved: Departments of Transportation, Agriculture, Interior and Commerce; the Environmental Protection Agency, U.S. Army Corps of Engineers and the Advisory Council on Historic Preservation.

9.8.5 National Park Overflight

Goal: Develop and implement policy concerning overflight of national parks that balances environmental and safety issues with the needs of air tour operators and others who fly over national parks. (Supports outcome 2)

Agencies Involved: DOT/Federal Aviation Administration lead, Department of Interior/National Park Service.